

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371

Attorney Docket No. 4597-039

U.S. Application No. (if known,
see 37 CFR 1.5)

107069949

INTERNATIONAL APPLICATION NO.
PCT/EP00/08723INTERNATIONAL FILING DATE
September 7, 2000PRIORITY DATE CLAIMED
September 9, 1999

TITLE OF INVENTION

METHOD AND HAND-HELD DEVICE FOR APPLYING A TOOTH FILLING ON SYNTHETIC RESIN BASIS INTO A CAVITY OF A TOOTH

APPLICANT(S) FOR DO/EO/US

Rainer Tilse

Applicant herewith submits to the United States Designated Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)).
 - a. ☐ are transmitted herewith (only if not required by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☐ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 16 below concern document(s) or information included:

1. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
2. ☐ As assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment.
14. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☐ Other items or information:

10/069949

JC13 Rec'd PCT/PTO 07 MAR 2002

17. <input checked="" type="checkbox"/> The following fees are submitted: BASIC NATIONAL FEE (37 CFR 1.492 (a)(1)-(5): Neither international preliminary examination fee (37 CFR 1.482) Nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO And International Search Report not prepared by EPO or JPO..... \$1,040.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by EPO or JPO.....\$890.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International search fee (37 CFR 1.445(a)(2)) paid to USPTO..... \$740.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) But all claims did not satisfy provisions of PCT Article 33(1)-(4).....\$710.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) And all claims satisfied provisions of PCT Article 33(1)-(4)..... \$100.00 ENTER APPROPRIATE BASIC FEE AMOUNT =				CALCULATIONS PTO USE ONLY	
				\$890.00	
Surcharge of \$130.00 for furnishing oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				\$	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total Claims	12 -20=		X \$18.00	\$	
Independent Claims	2 -3=		X \$84.00	\$	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)				\$	
TOTAL OF ABOVE CALCULATIONS =				\$890.00	
Reduction of 1/2 for filing by small entity, if applicable. A Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28).				\$445.00	
SUBTOTAL =				\$445.00	
Processing fee of \$130.00 for furnishing English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$	
TOTAL NATIONAL FEE =				\$445.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31).				\$	
TOTAL FEES ENCLOSED =				\$445.00	
				Amount to be refunded:	\$
				charged:	\$

- a. ☒ A check in the amount of \$445.00 to cover the above fees is enclosed.
- b. ☐ Please charge my Deposit Account No. 04-0753 in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.
- c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 04-0753. A duplicate copy of this sheet is enclosed.
- d. ☐ A payment of \$ _____ is made by credit card. A Credit Card Payment Form (PTO-2038) is attached hereto. The Commissioner is hereby authorized to charge payment of any additional filing fees required under 37 CFR 1.16 or any patent application processing fees under 37 CFR 1.17, or credit any over payment to the credit card account shown on the attached Credit Card Payment Form. Refund of all amounts overpaid, including those of twenty-five dollars or less, is specifically requested. Any fees not accepted by the credit card shown on Form PTO-2038 may be charged to Deposit Account No. 04-0753.

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 28666

REGISTRATION NUMBER

Dkt. 02045

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of: Group Art Unit:
RAINER TILSE Examiner:

Serial No.: US National Phase of
PCT/EP00/08723

Filed: concurrently herewith

For: METHOD AND HAND-HELD DEVICE FOR APPLYING A TOOTH FILLING
ON SYNTHETIC RESIN BASIS INTO A CAVITY OF A TOOTH

PRELIMINARY AMENDMENT

Honorable Assistant Commissioner for Patents
Washington, DC 20231

Sir:

Before calculation of the filing fee, please amend the
above-identified application as follows:

IN THE CLAIMS:

Please amend the claims as set forth hereinbelow and in
the attached appendix:

1. (Amended) Method of conditioning a filling compound
based on synthetic resin while it is being filled into a
cavity of a tooth, characterised in that the filling compound
is subjected to the action of a sound, especially ultrasound,
during the filling process.
5. (Amended) The hand-held device as defined in Claim 3,

characterised in that the supply container (9) sits exchangeably in a holder (2) and that the sound generator (13) is coupled to the holder (2) in oscillation-transmitting fashion.

6. (Amended) The hand-held device as defined in Claim 3, characterised in that the sound generator (13) comprises a piezoelectric oscillator.

7. (Amended) The hand-held device as defined in Claim 3, characterised in that the sound generator (13) comprises a magnetostrictive oscillator.

8. (Amended) The hand-held device as defined in Claim 3, characterised in that the sound generator comprises a pneumatically excited oscillator.

9. (Amended) The hand-held device as defined in Claim 3, characterised in that a common actuating element (4) is provided for the sound generator (13) and the conveying means (4, 5, 6).

10. (Amended) The hand-held device as defined in Claim 3, characterised in that it is configured in the way of a spray gun.

11. (Amended) The hand-held device as defined in Claim 3, characterised in that it is configured in the way of a dentist's handpiece.

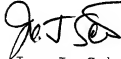
12. (Amended) The hand-held device as defined in Claim

10, characterised in that it comprises a lever or a push button as actuating element (4).

REMARKS

The claims have been amended to delete all multiple dependencies.

Respectfully submitted,
John C. Brezina, Esq., by

A handwritten signature in black ink, appearing to read 'Ira J. Schultz', with a stylized flourish at the end.

Ira J. Schultz
Registration No. 28666

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APPENDIX

IN THE CLAIMS:

1. (Amended) Method [for filling] of conditioning a filling compound based on synthetic resin [basis] while it is being filled into [the] a cavity of a tooth, characterised in that the filling compound is subjected to the action of a sound, especially ultrasound, during the filling process.

5. (Amended) The hand-held device as defined in Claim 3 [or Claim 4], characterised in that the supply container (9) sits exchangeably in a holder (2) and that the sound generator (13) is coupled to the holder (2) in oscillation-transmitting fashion.

6. (Amended) The hand-held device as defined in [any of Claims 3 to 5] Claim 3, characterised in that the sound generator (13) comprises a piezoelectric oscillator.

7. (Amended) The hand-held device as defined in [any of Claims 3 to 5] Claim 3, characterised in that the sound generator (13) comprises a magnetostrictive oscillator.

8. (Amended) The hand-held device as defined in [any of Claims 3 to 5] Claim 3, characterised in that the sound generator comprises a pneumatically excited oscillator.

9. (Amended) The hand-held device as defined in [any of Claims 3 to 8] Claim 3, characterised in that a common actuating element (4) is provided for the sound generator (13)

and the conveying means (4, 5, 6).

10. (Amended) The hand-held device as defined in [any of Claims 3 to 9] Claim 3, characterised in that it is configured in the way of a spray gun.

11. (Amended) The hand-held device as defined in [any of Claims 3 to 9] Claim 3, characterised in that it is configured in the way of a dentist's handpiece.

12. (Amended) The hand-held device as defined in Claim 10 [or Claim 11], characterised in that it comprises a lever or a push button as actuating element (4).

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TI01E001WO/Be00S012/TW/Be/04.09.2000

Dr.med.dent. Rainer Tilse, Bahnhofstrasse 2, 75172 Pforzheim

Method and hand-held device for applying a tooth filling on synthetic resin basis into a cavity of a tooth

Specification:

The present invention relates to a method having the features defined in the preamble of Claim 1, and to a hand-held device having the features defined in the preamble of Claim 3.

Since the time tooth fillings made from amalgam have first been discussed because of fears that the mercury contained in them might lead to health problems, an ever increasing number of tooth fillings made from plastic materials have been used. These fillings are made from filling compounds on a synthetic resin basis. It has been known to select as synthetic resin basis a synthetic resin that can be hardened by ultraviolet light, and to embed into that synthetic resin an inorganic powder or a mixture of different inorganic powders as fillers. The higher the proportion of the filler in the filling compound, the higher is the viscosity of the compound, and the lower is the degree of shrinkage during hardening. When preparing direct tooth fillings, it is however difficult to introduce highly viscous, pasty filling compounds into the cavity of the

tooth to be filled in such a way that the latter will be filled completely, and this especially in the case of narrow long cavities. The dentist has no means of knowing with certainty in this case if the filling compound has been brought down to the bottom of the cavity and if it fills the cavity completely. If direct fillings are prepared using filling compounds which contain a smaller proportion of filler and which, therefore, are less viscous, then it is of course possible to directly fill even narrow and deep cavities, but such filling compounds, that contain a smaller proportion of fillers, shrink more heavily when hardening, and this may give rise to gaps between the filling and the tooth and cracks in the filling which will cause damage to the tooth later. Low-viscous filling compounds are connected with the further disadvantage that until hardened they can be retained in the cavity to be filled with difficulty only and that there is a risk that parts of the filling compound may flow out of the cavity, deposit in undesirable areas of the crown, and/or penetrate into pockets between the dental neck and the gums. Due to the higher degree of shrinkage of the thinner filling compounds it is further difficult to achieve a filling with a surface that ends exactly flush with the surface of the crown in the environment of the cavity. Although filling compounds with a higher proportion of inorganic fillers provide the advantage that they shrink less heavily and that they are more abrasion-resistant, they can be filled into a cavity only with greater difficulty.

For filling a filling compound into a cavity of a tooth, there have been available hand-held devices in the form of guns or syringes with small supply containers in the form of cartridges placed therein. By pressing a lever, the filling compound is extruded through a nozzle configured as a small tube. The small tube is introduced into the cavity, or is placed on the latter's edge, in order to fill the cavity.

It has also been known to prepare indirect fillings with a resin-based filling compound. In the case of indirect fillings, an inlay consisting of a plastic or ceramic material, which has been prefabricated by a dental technician, is

bonded in a cavity managed in the occlusion surface of a molar tooth using the resin-based filling compound. If the filling compound used for this purpose is one that flows easily it is a problem that when pressing down the inlay any superfluous compound will be squeezed out laterally and will run down along the crown of the tooth and into pockets in the gums. In addition, the material shrinks as it cures, and this shrinkage may lead to the disadvantageous formation of cracks and gaps that has been described before. If, on the other hand, the filling compound used for preparing an indirect filling is one that exhibits a higher viscosity, containing a higher proportion of fillers, then there is no risk that the filling compound may run down along the crown of the tooth, but the highly viscous, pasty filling compound will to some degree resist spreading in the cavity between the tooth and the inlay when the latter is being pressed down. A certain progress has been achieved by a technique where the dentist employs a handpiece of the kind normally used for cleaning the teeth by means of ultrasound, for acting upon the inlay from the outside. The handpiece carries on its tip a detachable cleaning tool. The dentist removes that tool and replaces it by a special end piece onto which the ultrasonic oscillations are transmitted. The dentist presses the end piece onto the inlay. The action of the ultrasound reduces the viscosity of the filling compound so that it will spread more easily in the cavity under the inlay. The action of the ultrasound must be applied in several steps, with pauses between such steps, in order to prevent the filling compound from curing prematurely due to the heating-up effect produced by the ultrasound. This way of proceeding is limited to the preparation of indirect fillings because an inlay is required to permit the ultrasonic oscillations to be transmitted to the filling compound already present in the cavity.

Now, it is the **object** of the present invention to simplify the preparation of direct tooth fillings using filling compounds on the basis of synthetic resin, and to reduce or even fully overcome the disadvantages described before such as, especially, filling deficiencies, formation of cracks and the risk of filling compound escaping from the cavity.

This object is achieved by a method having the features defined in Claim 1 and a hand-held device having the features defined in Claim 3. Advantageous further developments of the invention are the subject of the dependent claims.

According to the invention, one acts upon the filling compound with sound of a frequency high enough to reduce the viscosity of the filling compound, especially with ultrasound, not only after the filling compound has been filled into a cavity, but already during the operation of filling the filling compound into the cavity. This was not possible heretofore in the first line because a suitable tool was not available for this purpose.

The invention provides considerable advantages:

- It can be employed for the preparation of direct fillings using highly viscous, pasty filling compounds that contain a high proportion of inorganic fillers. The filling compound, which initially is highly viscous and pasty, is caused to flow more easily during the filling-in process under the action of sound, especially ultrasound, and this in spite of the high content of fillers.
- It is thus possible to use for the normally highly viscous, pasty filling compound a narrow nozzle, especially in the form of a short and narrow small tube of the kind which under normal conditions can be used only for low-viscosity filling compounds.
- A narrow nozzle, especially in the form of a narrow small tube, allows without any problem the filling compound to be brought down to the very bottom of the cavity to be filled, and the cavity to be filled completely.
- Since the filling compound is subjected to the action of sound, especially ultrasound, as it flows through the nozzle, the filling compound will not heat up very much even when it is subjected to the action of sound continuously so that the cavity can be filled without any interruption.
- Once the filling compound has left the nozzle, the action of the sound on the compound diminishes rapidly, and the filling compound assumes once more

its highly viscous, pasty state. Accordingly, there is no longer a risk, not even with cavities that are open at the bottom, that the filling compound may flow out of the cavity.

- The invention facilitates and accelerates the dentist's work quite considerably.
- It is easily possible to prepare a direct filling that ends flush with the tooth surface surrounding the cavity.
- Due to the high proportion of inorganic fillers, especially powdered quartz, no gaps and cracks will form during hardening; the filling is wear-resistant and capable of closing the cavity permanently.
- Although the invention is especially well suited for direct fillings, it is suitable also for indirect fillings where it facilitates the determination of the correct quantity of filling compound needed and largely prevents the filling compound from flowing over as the inlay is pressed down.

Especially suited for filling a filling compound on synthetic resin basis into a cavity of a tooth is a hand-held device which takes the initially highly viscous, pasty filling compound from a supply container and which is provided with a nozzle from which the filling compound is then dispensed. The hand-held device comprises a sound generator, especially an ultrasound generator, that sets the nozzle into oscillation which oscillation is then transmitted to the filling compound as the latter flows through the nozzle. In addition, the hand-held device comprises a handle portion so that it can be handled by the dentist, and further means for conveying the filling compound out of the supply container and into the nozzle. This means may consist of a small piston pump by which the filling compound is pushed out of the supply container. There is, however, also the possibility to press the filling compound out of the supply container manually. In cases where the supply container is configured as small cartridge, the filling compound can be pressed out by means of a piston which can be operated manually using a lever or a push button. In cases where the supply container is configured as a tube or a flexible hose, a squeezing means may be

provided in the hand-held device for pressing out the filling compound by manual operation. The hand-held device can be configured in the way of a spray gun and may be provided with a lever which can be operated by the index finger, just as the firing lever of a pistol, and which allows the filling compound to be finely metered. But there is also the possibility to configure the hand-held device similar to a dentist's handpiece and to provide it, for example, with a lateral lever or push button of the kind known in connection with handpieces employed for the supply of compressed air and spray water, handling of which is well-known to any dentist so that he/she will be capable, without any difficulty, to employ the same handling technique also for the metered application of the filling compound.

Preferably, the lever or push button by which the process of conveying the filling compound is actuated, is simultaneously used as actuating element for the ultrasound generator so that by actuating a common actuating element the ultrasound generator and the conveying process will both be switched on. As soon as the actuating element is released, the conveying process stops and the ultrasound generator is switched off. This guarantees extremely comfortable handling for the dentist.

A piezoelectric oscillator is especially well-suited as an ultrasound generator because it is available in particularly small overall sizes. The use of a magnetostrictive oscillator or of an oscillator that is excited pneumatically is also possible.

Preferably, the nozzle sits exchangeably in the holder of the hand-held device so that it can be exchanged after every operation. The sound generator is then coupled to the nozzle holder in oscillation-transmitting fashion so that the oscillations are transmitted to the holder, from the holder to the nozzle and from the nozzle to the filling compound. Suited nozzles are short, narrow tubes that can be discarded after every operation for reasons of hygiene so that there is

no need to clean them from gradually curing plastic material.

The invention is suited for all kinds of filling compound based on synthetic resin, the viscosity of which can be temporarily reduced by the action of sound, especially the action of ultrasound of sufficiently high frequency. Such a behaviour is found with dispersions - a synthetic-resin compound filled with an inorganic filler is such a dispersion - which show thixotropic behaviour. The filling compound produced by Vivadent Ets. in FL 9494 Schaan (Liechtenstein) and sold under the trade name Tetric, which contains a mixture of UDMA ([2,2 (4), 4-trimethyl hexamethylene-bis-(2-carbamoyloxyethyl)] dimethacrylate), bis-GMA (isopropylidene-bis [2 (3)-hydroxy-3(2)-(4-phenoxy)propyl]-bis(methacrylate) and TEGDMA (triethylene glycol dimethacrylate) as well as 62 percent by volume of inorganic fillers with a particle size of between 0.04 μ m and 3 μ m may serve as an example. A mixture of silanised silicon dioxide, silanised barium glass filler and ytterbium (III)-fluoride is provided as filler. In addition to such composites, glass ionomer cements, compomers and ormoceres may also be used.

One embodiment of the invention is shown diagrammatically in the attached drawing in which:

Fig. 1 shows a side view of an applicator; and

Fig. 2 shows a top view, sectioned in part, of the front portion of the applicator as a detail.

The drawing shows an applicator 1 comprising a holding portion 2, a handle 3 and a lever 4 which is pivotally mounted on the holding portion 2 and which acts on a plunger 5 surrounded by a return spring 6, which latter is mounted between the holding portion 2 and the lever 4 for returning the lever 4 to its original position after it has been actuated.

The holding portion 2 comprises a tapering tube portion 7 with a recess 8 cut into its jacket at the forward pointed end so that a cartridge 9 can be inserted into the recess from the side. The cartridge 9 is provided with a flange 10 that abuts against a stop 11 provided in the tube portion 7.

The cartridge 9 contains a filling compound that can be pressed out through an angled nozzle 12. This is achieved by the plunger 5 which acts upon the rear end of the cartridge 9 when the dentist's hand urges the lever 4 against the handle 3.

The rear portion of the holding element 2 contains an ultrasound oscillator 13 operating especially on a piezoelectric basis. The ultrasound oscillator 13 is connected with the cartridge 9 by lamellas 14 extending longitudinally in the tube portion 7. Coupled with the lever 4 is an electric switch for switching the ultrasound oscillator on and off so that the ultrasound oscillator 13 is switched on when the lever 4 is actuated, and is switched off when the lever 4 is returned to its original position.

Claims:

1. Method for filling a filling compound on synthetic resin basis into the cavity of a tooth, **characterised in that** the filling compound is subjected to the action of sound, especially ultrasound, during the filling process.
2. The method as defined in Claim 1, **characterised in that** the filling compound is filled into the cavity using a nozzle (12) and that the nozzle (12) is subjected to the action of sound, especially ultrasound, during that process.
3. Hand-held device for filling a filling compound on synthetic resin basis from a supply container (9) into a cavity of a tooth using a nozzle (12) from which the filling compound is ejected, having means (4, 5, 6) for conveying the filling compound from the supply container (9) to the nozzle (12), and having a handle portion (3), **characterised in that** the hand-held device comprises a sound generator, especially an ultrasound generator (13) that sets the nozzle (12) into oscillation.
4. The hand-held device as defined in Claim 3, **characterised in that** the nozzle (12) is a short small tube.
5. The hand-held device as defined in Claim 3 or Claim 4, **characterised in that** the supply container (9) sits exchangeably in a holder (2) and that the sound generator (13) is coupled to the holder (2) in oscillation-transmitting fashion.
6. The hand-held device as defined in any of Claims 3 to 5, **characterised**

in that the sound generator (13) comprises a piezoelectric oscillator.

7. The hand-held device as defined in any of Claims 3 to 5, **characterised in that** the sound generator (13) comprises a magnetostrictive oscillator.
8. The hand-held device as defined in any of Claims 3 to 5, **characterised in that** the sound generator comprises a pneumatically excited oscillator.
9. The hand-held device as defined in any of Claims 3 to 8, **characterised in that** a common actuating element (4) is provided for the sound generator (13) and the conveying means (4, 5, 6).
10. The hand-held device as defined in any of Claims 3 to 9, **characterised in that** it is configured in the way of a spray gun.
11. The hand-held device as defined in any of Claims 3 to 9, **characterised in that** it is configured in the way of a dentist's handpiece.
12. The hand-held device as defined in Claim 10 or Claim 11, **characterised in that** it comprises a lever or a push button as actuating element (4).

Abstract:

Method for filling a filling compound on synthetic resin basis into the cavity of a tooth, wherein the filling compound is subjected to the action of ultrasound during the filling process.

(Figure 2)

Parts list:

- 1 Applicator
- 2 Holding portion
- 3 Handle
- 4 Lever
- 5 Plunger
- 6 Return spring
- 7 Tube portion
- 8 Recess
- 9 Cartridge
- 10 Flange
- 11 Stop element
- 12 Nozzle
- 13 Ultrasound oscillator
- 14 Lamellas

(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES
PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

(19) Weltorganisation für geistiges Eigentum
Internationales Büro



(43) Internationales Veröffentlichungsdatum
15. März 2001 (15.03.2001)

PCT

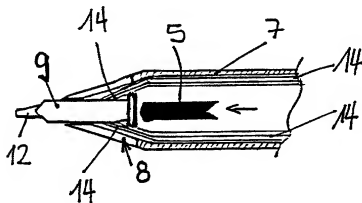
(10) Internationale Veröffentlichungsnummer
WO 01/17454 A1

- (51) Internationale Patentklassifikation⁷: A61C 5/06, 17/20 (74) Anwälte: TWELMEIER, Ulrich usw.; Zerronnenstrasse 23-25, 75172 Pforzheim (DE).
- (21) Internationales Aktenzeichen: PCT/EP00/08723 (81) Bestimmungsstaaten (*national*): JP, US.
- (22) Internationales Anmeldedatum: 7. September 2000 (07.09.2000) (84) Bestimmungsstaaten (*regional*): europäisches Patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).
- (25) Einreichungssprache: Deutsch
- (26) Veröffentlichungssprache: Deutsch
- (30) Angaben zur Priorität:
199 43 217.1 9. September 1999 (09.09.1999) DE
100 01 513.1 15. Januar 2000 (15.01.2000) DE
- (71) Anmelder und
(72) Erfinder: TILSE, Rainer [DE/DE]; Bahnhofstrasse 2, 75172 Pforzheim (DE).
- Veröffentlicht:
— Mit internationalem Recherchenbericht.
— Mit geänderten Ansprüchen.

Zur Erklärung der Zweibuchstaben-Codes, und der anderen Abkürzungen wird auf die Erklärungen ("Guidance Notes on Codes and Abbreviations") am Anfang jeder regulären Ausgabe der PCT-Gazette verwiesen.

(54) Title: METHOD AND INSTRUMENT FOR INTRODUCING A DENTAL FILLING MATERIAL WITH A SYNTHETIC-RESIN BASE INTO A TOOTH CAVITY

(54) Bezeichnung: VERFAHREN UND HANDGERÄT ZUM EINFÜLLEN EINER ZAHNFÜLLMASSE AUF KUNSTHARZ-BASIS IN EINE KAVITÄT EINES ZAHNES



(57) Abstract: The invention relates to a method for introducing a dental filling material with a synthetic resin base into a tooth cavity. According to said method, the filling material is treated with ultrasound radiation during the filling process.

(57) Zusammenfassung: Verfahren zum Einfüllen einer Zahnfüllmasse auf Kunstharzbasis in eine Kavität eines Zahnes, bei welchem während des Einfüllens mit Ultraschall auf die Füllmasse eingewirkt wird.

WO 01/17454 A1

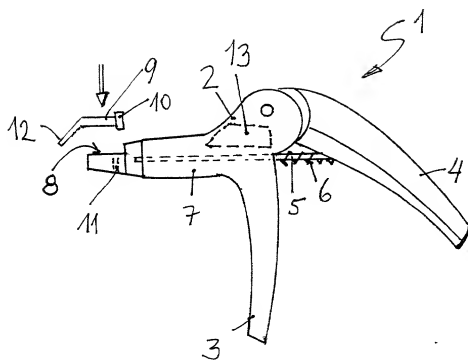


Fig. 1

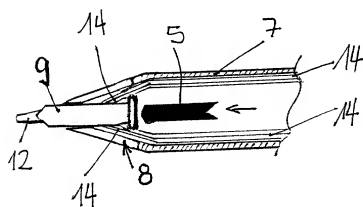


Fig. 2

DECLARATION AND POWER OF ATTORNEY

FOR APPLICATION TITLED: Method and hand-held device for applying
a tooth filling on synthetic resin basis
into a cavity of a tooth

INVENTOR(S): Rainer Tilse

As a below named inventor, I hereby declare that: my residence, post office address and citizenship are stated as below next to my name; that I believe I am an original, first and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled: Method and hand-held device for applying a tooth filling
on synthetic resin basis into a cavity of a tooth

the specification of which is attached.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, Sec. 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, Sec. 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed (if none, type or write none):

I hereby claim the benefits under Title 35, United States Code, Sec. 120 of any United States application(s) listed below and, in so far as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Sec. 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Sec. 1.56(a) which occurred between the filing date of the prior application and the national or PCT

DECLARATION AND POWER OF ATTORNEY
-continued-

international filing date of this application (if none, type or write none):

I hereby appoint the following attorneys, with full power of substitution and revocation, to prosecute this application and to transact all business in the United States Patent and Trademark Office connected therewith and request that all correspondence and telephone calls in respect to this application be directed to: BREZINA & EHRLICH,
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(312) 408-0077. John C. Brezina, Pat. Reg. No. 18,236; Ira Schultz, Pat.
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Pat. Reg. No. 22,190; et al.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application for any patent issued thereon.

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DECLARATION AND POWER OF ATTORNEY
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